CLAIMS

What is claimed is:

1. A process for providing ablation to a hollow organ, comprising the steps of:

providing an assembly comprising an expandable first balloon having a hollow inner region, a second balloon assembly comprising a hollow expandable region substantially located within the hollow region of the first balloon, at least one deployable active probe which is optionally electrically conductive, and an active element which is optionally an electrical conductor connected to the deployable active probe and extending from the hollow expandable region, and a third balloon comprising a hollow expandable region substantially located within the hollow expandable region of the second balloon;

providing a tube having a first end and a second end, the tube comprising a hollow region defined between the first end and the second end;

inserting the second end of the tube into the hollow organ;

inserting the assembly through the hollow region of the tube and extending from the second end of the tube into the hollow organ;

inflating the first compliant balloon assembly to expand the hollow organ;

inflating the second balloon to substantially contact the first compliant balloon;

inflating the third balloon to deploy the active probe though the first compliant balloon and into contact with the hollow organ.

2. The process of Claim 1, wherein the hollow organ is any of a stomach,

a duodenum,

an ileum,

a jejunum,

a sphincter, and

a uterus.

3. The process of Claim 1, wherein the second end of the tube is expandable between a first position and a second expanded position.

4. The process of Claim 1,wherein the active element is an electrical conductor, further comprising the step of:

measuring the impedance of the deployed probe through the electrical conductor.

5. The process of Claim 1, further comprising the step of:

applying energy to the deployed probe through the active element.

6. The process of Claim 5, wherein the applied energy is any of RF energy,

radiant energy,

microwave energy, and

laser energy.

7. The process of Claim 5, wherein the applied energy is variable.

8. The process of Claim 1, wherein the active element is an electrical conductor, further comprising the step of:

measuring the impedance of the deployed probe through the electrical conductor; applying energy to the deployed probe through the electrical conductor;

remeasuring the impedance of the deployed probe through the electrical conductor; and

comparing the measured impedance.

9. The process of Claim 1, wherein the assembly further comprises at least one thermal sensor.

10. The process of Claim 9, wherein the thermal sensor is any of a thermocouple,

a thermistor, and

an RTD.

11. The process of Claim 19, wherein the thermal sensor is in thermal contact with the deployed probe.

12. The process of Claim 1, wherein the assembly further comprises a flexible center rod extending into the hollow expandable region of the third balloon.

13. The process of Claim 1, further comprising the step of:

filling the inflated first compliant balloon assembly with an electrically conductive solution.

14. The process of Claim 13, wherein the electrically conductive solution comprises a saline solution.

15. The process of Claim 1, wherein the second balloon assembly further comprises:

means for moving the active probe between an undeployed position and a deployed position.

16. The process of Claim 15, wherein the moving means comprises any of a leaf spring,

a coil spring, and

an elastomer spring.

17. The process of Claim 15, wherein the moving means further comprises:

a deployment travel limiter.

18. The process of Claim 1, wherein the probe is a needle.

19. The process of Claim 1, wherein the probe further comprises a hollow region which extends through the probe.

20. The process of Claim 1, wherein the probe further comprises an electrically insulative region.

21. The process of Claim 1, wherein the probe further comprises a coolant port.

22. The process of Claim 1, wherein the second balloon assembly is at least partially electrically conductive.

23. A process for providing ablation to a hollow organ, comprising the steps of:

providing an assembly comprising an expandable first balloon having a hollow inner region, a second balloon assembly comprising a hollow expandable region substantially located within the hollow region of the first balloon, at least one deployable active, electrically conductive probe and a third balloon comprising a hollow expandable region substantially located within the hollow expandable region of the second balloon;

w/o active element probe Cryogen

providing a tube having a first end and a second end, the tube comprising a hollow region defined between the first end and the second end;

inserting the second end of the tube into the hollow organ;

inserting the assembly through the hollow region of the tube and extending from the second end of the tube into the hollow organ;

inflating the first compliant balloon assembly to expand the hollow organ;

inflating the second balloon to substantially contact the first compliant balloon;

inflating the third balloon to deploy the electrically conductive probe though the first compliant balloon and into contact with the hollow organ.

24. The process of Claim 23, further comprising the step of:

at least partially filling the inflated first compliant balloon with a fluid.

25. The process of Claim 23, wherein the fluid is electrically conductive.

26. The process of Claim 25, further comprising the step of:

measuring the impedance of the deployed needle through the electrically conductive fluid.

27. The process of Claim 25, further comprising the step of:

applying energy to the deployed needle through the electrically conductive fluid.

28. The process of Claim 27, wherein the applied energy is any of RF energy,

radiant energy,

microwave energy, and

laser energy.

29. The process of Claim 27, wherein the applied energy is variable.

30. The process of Claim 25, further comprising the step of:

measuring the impedance of the deployed needle through the electrically conductive fluid;

applying energy to the deployed needle through the electrically conductive fluid;

remeasuring the impedance of the deployed needle through the electrically conductive fluid; and

comparing the measured impedance.

31. The process of Claim 24, wherein the fluid comprises a saline solution.

32. The process of Claim 31, wherein the fluid further comprises a pharmaceutical solution.

33. The process of Claim 23, wherein the hollow organ is any of a stomach,

a duodenum,

an ileum,

a jejunum,

a sphincter, and

a uterus.

34. The process of Claim 23, wherein the second end of the tube is expandable between a first position and a second expanded position.

35. The process of Claim 23, wherein the assembly further comprises at least one thermal sensor.

36. The process of Claim 34, wherein the thermal sensor is any of a thermocouple,
a thermistor, and
an RTD.

37. The process of Claim 35, wherein the thermal sensor is in thermal contact with the deployed needle.

38. The process of Claim 23, wherein the assembly further comprises a flexible center rod extending into the hollow expandable region of the third balloon.

39. The process of Claim 23, wherein the second balloon assembly further comprises:
means for moving the active probe between an undeployed position and a deployed position.

40. The process of Claim 38, wherein the moving means comprises any of a leaf spring,
a coil spring,
an elastomer spring, and
a deployment travel limiter.

41. The process of Claim 23, wherein the probe is a needle.

42. The process of Claim 23, wherein the probe further comprises a hollow region which extends through the probe.

43. The process of Claim 23, wherein the probe further comprises an electrically insulative region

44. The process of Claim 23, wherein the probe further comprises a coolant port.

45. The process of Claim 23, wherein the second balloon assembly is at least partially electrically conductive.

46. An apparatus, comprising:

an expandable first balloon having a hollow inner region;

a second balloon assembly comprising a hollow expandable region substantially located within the hollow region of the first balloon, at least one deployable, active, optionally electrically conductive, needle and an active element, which optionally comprises an electrical conductor, connected to the deployable, active needle and extending from the hollow expandable region; and

a third balloon comprising a hollow expandable region substantially located within the hollow expandable region of the second balloon.

47. The apparatus of Claim 46, further comprising:

a flexible center rod extending into the hollow expandable region of the third balloon.

48. The apparatus of Claim 46, wherein the second balloon assembly further comprises a thermal sensor.

49. The apparatus of Claim 48, wherein the thermal sensor is attached to the deployable active needle.

50. The apparatus of Claim 46, wherein the deployable active needle as electrically conductive further comprises an electrically insulative section.

51. The apparatus of 50, wherein the electrically insulative section comprises any of polyimide,

nylon, and
polyester.

52. The apparatus of Claim 46, wherein the active needle has a first position, in which the tip is located below the outer surface of the balloon, and a second position, in which the tip is extended from the outer surface of the balloon.

53. The apparatus of Claim 51, wherein the second balloon further comprises a hydraulic actuator for movement of the active needle between the first position and the second position.

54. An apparatus, comprising:

an expandable balloon having an outer surface and a hollow inner region having an entrance;

at least one active, optionally electrically conductive probe having a tip located on the balloon, the active probe having a first position, in which the tip is located below the outer surface of the balloon, and a second position, in which the tip is extended from the outer surface of the balloon.

55. The apparatus of Claim 54, further comprising:

at least one thermal sensor in thermal contact with the outer surface of the balloon.

56. The apparatus of Claim 54, further comprising:

means for applying energy to the active probe.

57. The apparatus of Claim 55, wherein the energy is any of RF energy; radiant energy; microwave energy; and laser energy.

58. An apparatus, comprising:

a body having an outer surface;

at least one active electrically conductive probe having a tip located on the body, the active probe having a first position, in which the tip is located below the

outer surface of the body, and a second position, in which the tip is extended from the outer surface of the body;

an energy conveying connection to the active probe.

59. The apparatus of Claim 58, further comprising:

means for moving the probe from the first position to the second position.

60. The apparatus of Claim 58, further comprising:

means for moving the probe from the second position to the first position.

61. The apparatus of Claim 58, further comprising:

means for applying energy to the active probe.

62. An apparatus, comprising:

a body having an outer surface, the outer surface having a recessed region;

at least one active, optionally electrically conductive, probe having a tip located on the body within the recessed region;

an orifice extending from the recess region and through the body; and

an energy conveying connection to the active probe.

63. The apparatus of Claim 62, further comprising:

means for applying a vacuum to the orifice.

64. The apparatus of Claim 62, further comprising:

means for applying energy to the energy conveying connection.

65. An apparatus, comprising:

an expandable balloon having an outer surface and a hollow inner region having an entrance;

at least two electrically conductive probe traces located on the outer surface of the balloon, the electrically conductive probe traces having at least one defined probe region defined there between; and

means for applying energy between the electrically conductive probe traces.

66. The apparatus of Claim 65, further comprising:

at least one thermal sensor in thermal contact with the outer surface of the balloon.

67. The apparatus of Claim 65, wherein the energy is any of RF energy and microwave energy.

68. The apparatus of Claim 65, wherein the expandable balloon further comprises holes extending between the hollow inner region and the outer surface.

69. The apparatus of Claim 68, wherein the holes are located in the defined probe region.